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An Accomp of some Books.

I. Of the USEFULNESS of EXPERIMENTAL NATURAL PHILOSOPHY, the Second Tome; by the Honourable Robert Boyle Esq; Fellow of the R. Society. Oxford 1671. in 4°.

THIS Illustrious Author, in pursuance of his design, began in the *First Tome* of this Work (published many years since) which is to manifest, that Experimental Philosophy is conducive to improve the Understanding and to increase the Power of Man, proceeds in this *Second Tome* to deliver Six very Instructive and Useful *Essays*.

The *First* of which contains some General Considerations about the Means, whereby Experimental Philosophy may become Advantagious to *Human Life*; not only by bringing improvements both to the *Trades* that minister to the Necessities of Mankind, and to those that serve for Mans Accommodation and Delights; but also by introducing *New* ones, partly such as are altogether *newly invented*, and partly such as are *unknown* in the place, where the Naturalist brings them in request. And not only so, but it shews further, that there is not any one Profession or Condition of Men, (perhaps not any single person of Mankind) that may not be some way or other advantaged or accommodated, if all the Truths discoverable by Natural Philosophy, and the Applications that might be made of them, were known to the Persons concerned in them: Intimating withall the Causes of Barrenness, that have hitherto kept Physicks from being considerably Useful; such as are, *Many* false and fruitless Doctrines of the Schools; the Prejudices, by which men have been hitherto impos'd on about Substantial Forms, and the Essential difference betwixt Natural and Artificial things, &c; a too plausible despondency; a want of belief that Physicks much concern'd Mens Interests; want of encouragement, of Curiosity, of a Method of enquiring and Experimenting; of Mathematicks and Mechanicks; of associated endeavours, and the like.

The

The *Second* Essay treats of the Usefulness of *Mathematicks* to Natural Philosophy ; shewing, that the Empire of Man may be considerably promoted by the *Naturalists* skill in those Sciences, as well Pure as Mixt.

The *Third* proveth the Usefulness of *Mechanical Disciplines* to Natural Philosophy, shewing, that the Power of man may be much increased by the *Naturalists* skill in *Mechanicks* ; forasmuch as Nature does play the Mechanitian, not only in Plants and Animals and their parts, but in many other curiously contrived Bodies.

The *Fourth* manifests, That the *Good* of Mankind may be much increased by the *Naturalists* Insight into *Trades* : for the making out of which, the Author endeavors to shew two things ; the *one*, that an Insight into Trades may improve the *Naturalists* knowledge ; the *other*, that the *Natural Philosopher*, as well by the skill thus obtained, as by the other parts of his knowledge, may be enabled to improve Trades ; and this *partly* by increasing the number of Trades and adding New ones ; *partly*, by uniting the Observations and Practises of differing Trades into one Body of *Collections* ; *partly*, by suggesting improvements in some kind or other of the particular Trades. And here we cannot but observe, that our Noble Author taketh particular care in the *Preamble* to this Book, very fully to answer the objection, clamorously pressed by some, as if Tradesmen were injured by discovering those things, which are called the *Mysteries* of their Arts.

The *Fifth* maketh it out, That that may be done by *Physical knowledge*, what is wont to require *Manual skill*, or, that the knowledge of peculiar Qualities, or Uses of Physical things, may enable a man to perform those things Physicaly, that seem to require Tools and Dexterity of Hand, proper to Artificers.

The *Sixth* and last represents Mens great *Ignorance* of the Uses of *Natural things* ; or, that there is scarce any one thing in Nature, whereof the Uses to humane Life are yet throughly understood : which is done, *both* to rouze up the

the Curiosity of Men by shewing how much it hath been defective, *and to encourage it also*, by shewing how much of Nature there remains yet undiscover'd, to recompense as well as to exercise our Industry.

From the whole, the Attentive Reader will, besides the advantages that are common to it with the formerly publish'd *Tome*, easily gather these peculiar uses: *First*, that it may afford many Materials for the History of Nature; which that it might the more plentifully do, the Author hath purposely on several occasions added a greater number of Instances, than were absolutely necessary for the making out of what he intended to declare or prove. *Secondly*, it may afford some Instructions, Advices and Intimations to promote the Practical or Operative part of Natural Philosophy in divers particulars, wherein Men have been either not able, or not solicitous to assist the Curious. *Thirdly*, it may enable Gentlemen and Schollars to converse with Tradesmen, and benefit themselves (and perhaps the Tradesmen too) by that Conversation; or at least, it will qualify them to ask questions of Men that converse with things; and sometimes to exchange Experiments with them. *Fourthly*, it may serve to beget a confederacy and an Union between parts of Learning, whose Possessors have hitherto kept their respective skills strangers to one another; and by that means bring great Variety of Observations and Experiments of differing kinds into the Notice of one man, or of the same persons; a thing that may prove very advantageous towards the increase of knowledge. *Fifthly*, it may contribute to the rescuing of Natural Philosophy from that unhappy Impputation of Barrenness, which it hath so long lain under, and which hath been, and still is, so prejudicial to it. And *Lastly* and principally, it may serve by Positive Considerations and Directions, to awaken the Generality of those that are any thing inquisitive, and both loudly excite and somewhat assist the Curiosity of Mankind; from which alone may be expected a greater progress in Useful Learning, and consequently greater advantages to men, than in the present State of Humane affairs will be easily imagined.

II. *Enchiridion METAPHYSICUM, sive de REBUS IN-CORPOREIS Dissertation, per H. M. Cantabrigiensem.*
Londini 1671. in 4°.

Though this Treatise at the first aspect may seem not to be suitable to make an Ingredient of these *Tracts*, whose design and business it is to give an account of what is transacting among Learned and Ingenious Men in *Physical, Mathematical and Mechanical matters*; yet, after it shall have been made to appear, how great a number of *Corporeal Phænomena* of the world and how many *Physical Experiments* are made use of and examined in this Book, in order to the attainment of the End proposed by the Author, it will then, 'tis presumed, be thought proper enough to be taken notice of in these Papers; it being so complicate with what Philosophers look upon as the very Principles of the Effects of Nature, *Matter* and *Motion*.

The Learned Author then, worthily designing in this *First part* to evince the *Existence* of *Incorporeal Beings*, and to explain the *Nature* of them, thinks fit, for the compassing of that design, to consider and examine divers of the chief *Phænomena* of the World, which have been by *Des-Cartes* and other noted Philosophers refer'd to meer *Mechanical Causes*; and upon examination to represent, that they are in vain and falsely ascribed to such Principles, and that consequently *Inmaterial Beings* must needs be acknowledged to be the Causes of them. Which how successfully it is by him perform'd, we must leave to Perspicacious and Candid Readers to Judge: Our part only being to deliver here some of the principal Heads of this Treatise, and thereby to invite Judicious men to weigh the whole matter.

Passing by therefore that part of this Dissertation, which is meerly Metaphysical, we shall observe, *First*, that our Author chargeth the famous *Des-Cartes* to have deliver'd a precarious and a very unphilosophical definition of *Motion*, such

such an one as is repugnant to Sense and all the Rational faculties, and to have introduced such Principles, whereby he might assert a *Necessity* of Existence in Matter.

Next he maketh it his business to demonstrate, that there is some Extended immoveable, not imaginary, but real, Being, distinct from moveable Matter; which thing he maketh Spiritual and Immaterial, pervading the whole Universe and penetrating all Matter, and that which hath ever been and will be for ever (independently from our cogitation) and is something Divine. Where it may be observed, that, whereas *Des-Cartes* will have that Space, which is called *Vacuum*, to be that Corporeal substance, called *Matter*, he (our Author) labours to shew, that that Space or Internal Place is really distinct from Matter, and an Incorporeal Spirit; affirming thereupon, that by the same door, by which the *Cartesian* Philosophy seems to have endeavour'd to exclude God out of the World, he hath again introduced him, and attributing the same Titles to this Internal Place, that are ascribed to God, and making the Existence of this Space as eternal and necessary, as that of a Deity. See p. 63. 64. 66. 69. 71. &c.

From this Extended Immovable Substance he deduceth, that all Spirit, contradistinct to Matter, is extended or hath an Amplitude, yet not Physically, though mentally, divisible into parts; and would have us consider this immense and immaterial space and substance, as some Representation of the Divine Essence, yet with a precision from the Life and Operations of the same.

Then proceeding to the *First Matter*, as tis in it self, he defineth it to be an Homogeneal Congeates of Physical Monads or minute particles, that are not any more divisible, and that are impenetrable, and incapable to cohere and move of themselves, though capable to be united and mov'd; whence he esteems, that the Existence of an Incorporeal substance can be sufficiently demonstrated, forasmuch as those minute particles cannot coalesce nor move of themselves.

Another argument to demonstrate the Existence of Incorporeal Beings he deduceth from the Successive Duration of the World. And then passeth on to prove the same (which doubtless the Reader will be surprised at) from divers *Phænomena* of Nature, by him conceived not explicable by meer *Mechanical* causes ; as from those of Gravity ; from some Experiments performed in the *Machina Boyleiana*, as that of the Suckers ascent with a great weight hung to it, and that of the firm Cohæsion of the two Marbles ; as also from those *Hydrostatical* Experiments, concerning the Gravitation of water upon water ; and concerning ponderous Bodies not sinking at a competent depth, and the Body of a Diver not sensible of pain : To which he adds those proofs, which he thinks may be taken, for the same purpose, from the Flux and Reflux of the Sea ; from Maghetismus ; from the Bigness and Figure of the Sun and Stars ; from the immense Celerity of the Globuls in the upper part of the Vortex, and the Motion of Comets ; from the nature of Light and Colours ; from the generation of the Clouds and the roundness of Rain-drops, and the Rain-bow ; from the Winds, Thunder and Lightning ; from the Structure of Plants and Animals ; from the Operations of the Soul ; and from all those *Phænomena* that are above and besides Nature. After all which he giveth us his Définition of a *Spirit* in general, together with its Explication ; where he undertaketh both to make it out, Why an extended *spirit* is more capable of *Perception*, than extended *Matter*? And, to shew, How a Spirit, so subtile and penetrative, that it seems not capable of adhering to Matter, may yet be conceived able to move and impell Matter? And that the cohæsion of a Spirit with Matter is as intelligible, as the Union of one part of Matter with another.

III. *DIOPHANT' Alexandrini ARITHMETICORUM Libri sex, & de NUMERIS MULTANGELIS Liber unus*; cum *Commentarius C. G. Bacheti*, & *Observationibus D. P. de Fermat Senatoris Tholosani*: *Cui accessit Doctrinæ Analyticæ Inventum Novum*: Tolosæ, 1670. in Folio.

Being inform'd, that there is an Able Mathematician here, that intends to publish in due time his considerations touching what is said to be New in this Edition, we shall here only intimate, That in this Book, the Works of *Diophantus Alexandrinus* (concerning Numeral Algebra or Analyticks, and Figurate Numbers) as they were formerly published in *Greek* and *Latin* by *Gasper Bachet*, with his Commentaries thereon, and some Treatises of his own, prefixed and subjoynd thereto; are now printed anew with the Annotations of that Excellent Senator of the Parliament of *Thoulouse*, *Monsieur Fermat*; together with some New Inventions of His in Numeral Algebra, and the Solution of divers Numeral Problems, omitted by others: Collected out of his private Letters by *R. P. Jacobus de Billy S. I.* All published by *Monsieur Fermat*, P. Fil.

IV. *ROSETUM GEOMETRICUM, cum Censura brevi Doctrinæ Wallisianæ de Motu, Auth. Thomi Hobbes Malmesburiensis. Londini apud Guil. Crook, ad sign. Dracenis viridis without Temple-bar. 1671. in 4°.*

THe Author of this Tract tells his Algebrist Reader in his *Preface* to him, that he will end the Controversie he hath with him (if he pleaseth) in this manner. First he would have him inquire, Whether a series of equal quantities, or of such as encrease in a certain ration, as duplicit, or triplicat, &c. be a finit or infinit quantity. If he finds it to be *Infinit*; he would then have him inquire, Whether that can have any proportion to a *Finit* quantity. Thirdly, he would have him inquire, Whether a Line or any other Magnitude be not divisible in *infinitum*; or, whether there can be a quantity infinitely small? If he finds, that all quan-

ity is ever divisible, and that a series of equal quantities, or of such as do increase equally, or in a *duplicat* or *triplicat* ratio, is *atq; Infinit* quantity; and holds no proportion to a *Finit*: and that there is no quantity infinitely small; then he would have him grant, that the Doctrine of Dr. *Wallis* in his *Arithmetica Infinitorum*, and in his Book of *Motion* lately publish'd, is vain and false as founded on them; but if other wise, he will yeild the victory.

The Book it self treateth first of 21 *Propositions*, said by the Author to have been attempted hitherto in vain: adding a Censure concerning Dr. *Wallis*'s two first parts of *Motion* and *Mechanicks*, which hath some strictures accusing those Treatises of Obscurity and vicious Definitions; which how justly 'tis done, I leave to the Readers Judgment, or to the Answer that may be expected from the Person concerned.

V. *The Prodromus of a Dissertation concerning a SOLID CONTAINED IN A SOLID*, by Nicolaus Steno. English'd out of Latin. London 1671. by Moses Pitt in Little Britain, in 8°.

THe Author of this Curious and Learned *Prodromus* apprehending, that he might be diverted for a great while from finishing his intended main Dissertation touching the *Frame* and *Changes* of the *Earth*, and the *Manner* of the *Productions* made therein; thought fit to deliver in this Tract both a Scheme and a Breviate of the same; forasmuch as he doth not only delineate the Method, he hath therein observed, but also sums up the most considerable particulars of his whole Design.

He saith then, that he hath divided that Dissertation of his into *Four* parts. The *First*, by way of *Introduction*, is to shew, that the Question about *Marine substances*, found at a great distance from the Sea, is ancient, pleasant and useful, and that, though the Solution thereof have been hitherto very uncertain, yet he hopeth he shall be able to bring it to a certainty. The *Second*, resolveth this General Problem (whence he conceiveth that the Explication

of all the difficulties about this Subject depends,) viz. A Natural Body of a certain Figure being given, to find arguments and marks in the Body it self, whereby to detect the Place and Manner of its Production : Which Problem he affirms to have so resolved, that no Sect of Philosophers shall find just cause to except against the Principles and Notions by him supposed for its Explication. The Third is design'd to examine the Particular Solids included in a Solid, according to the Laws discover'd in the Resolution of the General Problem. The Fourth is to represent, the different States or Constitutions of Toscany (for Instance) and propoundeth a way of Explicating the Phænomena of the General Deluge, not contradicting the Laws of Natural Motions.

And so much for his designed Method. As to the Summ of the most remarkable particulars of the whole work, it may be reduced to this.

First, he comprehends, what he hath to offer about his above-mentioned General Problem, in three Propositions; One is, that if a Solid Body be every way encompass'd with another Solid Body, that of the two was first hardned; which by the mutual contact expresseth on its surface the proprieties of the surface of the other. The Second is, that if a Solid Body be every way like another Solid Body, not only as to the condition of its surface, but also as to the inward frame and texture of its parts, it is also like to it as to the Manner and Place of its production; excepting only those qualities of Place, which are often found in it, and are not any advantage or disadvantage to the production of the Body there lodged. The Third is, that a Body produced according to the Laws of Nature, is produced out of a Fluid. Where yet he waveth the first Delineations in the production of Solid Bodys, but delivers several positions about their Increase.

Having thus generally consider'd a Solid contain'd within a Solid, he proceeds to a Particular examination of those various Solids, that are digg'd out of several parts of the Earth, as *Incrustations*, *Sediments* or *Beds*, *Angular Bodies*,

shells of Sea-fishes, the shapes of *Cockles* and *Plants*, &c.

From the *Change* of the *Scite* of *Beds* he giveth an Account; 1. Of the Principal Origin of *Mountains*, *Hillocks*, and *Valleys*, and their various Constitution, Matter, Shape, &c. 2. Of the Passages for *Springs* and *Winds* rushing out of *Mountains*, foetid Exhalations, hot Ebullitions; as also of the Changes of Hot Springs into Cold, and the Turning of the Course of Rivers another way; of Rivers running in one place under ground, and rising again in another; of whole Countries being swallow'd up with their Houses and Trees; of great Lakes now appearing where Towns stood formerly, &c. 3. Of the many kinds of *variegated Stones*, as also of the Receptacles of *Minerals*; where do occur very good Observations.

In his discourse about *Angular Bodies*, he de'ivers many considerable things about the Production of *Chryſtals* in the Cavities of Stones, about their first Concretion between two Fluids, or between a Fluid and a Solid, or in a Fluid; as also about the *Motion* of the Chryſtal in matter, whereby it is determin'd to the Planes of the all-ready form'd Chryſtal. Concluding from his Observations, that extream Cold is not the Efficient cause of Chryſtals; nor that 'tis the Ashes alone burnt by fire that turn into Glass; nor the force of the Fire alone that produceth Glass; and that 'tis not beyond the power of Man, to discover a production of Glass without the violence of Fire: Where, by the by, he intimates what it is, whence depends the main cause of the difference of Chryſtal from Glass, both as to Refraction and other Operations.

From Chryſtals he passeth on to consider the Angular Bodies of *Iron* and *Copper*; and sheweth, how the production of them agreeeth in some things with that of Chryſtals, and how it differs from them.

Thence he goes on to *Diamonds*, and observeth, how they also are produced in a Fluid inclosed in the Cavities of Stones, together with the variety of their Figure. Next, he discoureth of *Marcasites*, and delivers also several Observations

servations about the *Selenites*, and of *Talc*, and affirms in particular, that the Solid body of *Talc* may be *dissolv'd* into a Fluid, as being *coagulated* from a Fluid, though that dissolution cannot at all be perform'd by Fire, forasmuch as that part of it, which is able to dissolve it, flies away by the torture of the Fire.

After this he proceeds to *Shells*, both taken out of the Sea, and found in Mountains; shewing, of what and how they are produced, and whence proceeds the variety of colours seen in them; and explaining particularly, how *Pearls* are produced, as well those, that being fastn'd to the Shels are not so very round, as those which by reason of the obstruction of the pores in the Animals surface acquire a round figure within the pores themselves: where occur many (in my opinion) very curious and uncommon Observations of the Coats of Pearls and the Shels of Pearl-bearing Fishes, and their difference; as also of the cause of the different Colours in Pearls; making it manifest, that though globuls made up of various coats may be contriv'd by Art, in imitation of Nature; yet to dispose their tunicles out of a series of threds by an apposition of one to another, whence depends the native splendor of Pearls, will be very hard to effect.

Next, he giveth an account of *shels lying under-ground*, affirming, that they were once the parts of Animals living in Water, and proving it by the sole inspection and consideration of those Shels themselves. Which done, he maketh out the particular *Phænomena* of divers of them found in *Toscany*. And what he hath said of Shels, he affirms also of other parts of Animals, and of the Animals themselves buried in the Earth, such as are the Teeth of Sea dogs, the Back-bones of Fishes, various sorts of whole Fishes, Skuls, Horns, Teeth, Shanks and other Bones of Terrestrial Animals; where he informs us particularly, what to judge not only of the great number of Teeth brought away every year from *Maltha*; but also of the huge Thigh-bones, Skuls, Teeth, and other Bones digg'd out of the Earth.

Which

Which done, he labours to evince by a notable Instance, that the production of many Shells found in these times is to be referr'd to the times coincident with the General Deluge. And what he hath prov'd of Animals and their parts, he extends to *Vegetables* found under ground ; shewing withal, what may be conceived of the *Figures* of Plants appearing on Stones.

He concludeth this *Prodromus* with a remarkable Information, shewing, How we may from the present Face of the Earth, by an attentive view, discover the former state of it. Which he endeavours to make out by an Example taken from *Toscany* ; in the present Face of which he conceiveth, that the obvious Inequalities proclaim to an heedful Observer manifest arguments and signs of Six different Changes happen'd therein ; the face of it having been, by his Observations, twice fluid, twice plane and dry, and twice un-even ; which as he attempts to demonstrate by an Induction of many places in *Toscany* view'd by himself, so he confirms it of the Whole Earth by the Descriptions of various parts of the World made by several Authors ; obviating the chief difficulties, that may occur about each Face and particular Constitution of the Earth.

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L O N D O N.

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